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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/707,657	12/30/2003	James Kenneth Aragones	RD28217-2	1656

41838 7590 01/08/2007  
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EXAMINER
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CRAIG, DWIN M

ART UNIT	PAPER NUMBER
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2123

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/08/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

**Office Action Summary**

Application No.

10/707,657

Applicant(s)

ARAGONES ET AL.

Examiner

Dwin M. Craig

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 30 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 December 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>6/23/04</u> . | 6) <input type="checkbox"/> Other: _____  |

### DETAILED ACTION

1. Claims 1-24 have been presented for examination.

#### *Claim Rejections - 35 USC § 101*

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

2. Claims 1-24 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

2.1 Claims 1-24 are directed to a baseline model of an engine. This claimed subject matter lacks a practical application of a judicial exception (law of nature, abstract idea, naturally occurring article/phenomenon) since it fails to produce a useful, concrete and tangible result. Specifically, the claimed subject matter does not produce a tangible result because the claimed subject matter fails to produce a result that is limited to having real world value rather than a result that may be interpreted to be abstract in nature as for example, a thought, a computation, or manipulated data. More specifically, the claimed subject matter provides for calculating statistical correlations of data used for an engine baseline model. The produced result remains in the abstract and, thus, fails to achieve the required status of having real world value.

2.2 Claims 17-24 are rejected as indicated above and further because the claims are teaching functional descriptive material on a computer readable medium which is nonstatutory subject matter, see section 2106.1 "Computer-Related Nonstatutory Subject Matter" MPEP August 2006 edition.

Amendment is required.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 1-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent 5,018,069 Pettigrew in view of US Patent 5,727,128 Morrison.

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3.1 Regarding claim 1, Pettigrew teaches a system for quantifying baseline model quality, comprising:

an engine service database containing engine data (Col. 3 lines 60-61 "...with stored, standard performance baselines representing engines in good conditions..." and Col. 4 line 39 "...a ground computer database...");

an engine baseline modeling component that builds an engine baseline model from data, wherein the engine baseline model relates engine performance variables as a function of engine operating conditions; (Col. 3 lines 7-54) and a model diagnostics component that evaluates the performance of the engine baseline model (Col. 2 lines 19-46 "...engine diagnostic data (REDD) format..."),

wherein the model diagnostics component includes: means for comparing engine data from a plurality of engines against the engine baseline model (Col. 3 lines 10-20); means for generating engine trends for each of the plurality of engines (Col. 3 lines 66-67 and Col. 4 lines 1-4); means for identifying correlations between the engine trends (Figure 5 #250) and various parameters (Col. 4 lines 2-4 "...are an indication of the degree of deviation between these actual functions and standard baselines..." and Col. 3 lines 20-67); and means for calculating, for each identified correlation (Figure 2 # 112 and Col. 4 lines 35-66), summary statistics relating to the degree of correlation (Figure 2 #120 and Figure 3, Col. 2 lines 64-66 and Col. 11 lines 8-23) see also Col. 5 lines 5-34, Table 1 and Col. 10 lines 5-9.

However, Pettigrew does not expressly disclose a preprocessor for processing the engine data into a predetermined format.

Morrison teaches a preprocessor for processing the engine data into a predetermined format (Col. 3 lines 1-8) and Morrison also teaches determining means for the correlation of data to a model (Col. 5 & 6).

Pettigrew and Morrison are analogous art because they are in the same problem solving area of statistical model of data to determine trends.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to have used the data processing methods of Morrison in combination with the engine baseline methods of Pettigrew.

The motivation for doing so would have been to provide an efficient method of training a neural network in order to correlate data to a model of a process or more specifically address the problem as disclosed by the call of applicants' claims, the ability to diagnose a baseline model by comparing baseline data with a model (see Morrison Col. 5 lines 18-37).

Therefore, it would have been obvious to combine Morrison with Pettigrew to obtain the invention in claims 1-24.

**3.2** Regarding claim 2, Pettigrew does not expressly disclose means for identifying correlations between engine trends and various parameters further generate correlation coefficients for each identified correlation.

Morrison teaches (Col. 4 & 5).

**3.3** Regarding claim 3, Pettigrew teaches a standard deviation therefore meets the call of the claim (Figure 4 #224 and Col. 7 lines 52-68).

**3.4** Regarding claim 4, Pettigrew teaches the functional equivalent of wherein a good model is best represented by summary statistics tending toward zero (Figure 3 and Col. 2 lines 47-53

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not that if the “*model*” is “*good*” then properly operating components are not removed see also Morrison Col. 4 lines 29-43 “...a low PLS sensitivity value (near 0.0)...”).

**3.5** Regarding claim 5, the rejection of claim 1 substantially teaches all of the limitations as disclosed in claim 5 with the exception that claim 5 claims a means for plotting data points as well as a means for curve fitting (or smoothing). Pettigrew discloses a means for plotting data points (Figure 2 # 120 and Col. 4 lines 44-49), and Morrison discloses means for time-varying analysis and means for smoothing a curve (Col. 4 lines 22-29 “...applies a line-fit to a set of input and output data...” and regarding time-varying data see Morrison Col. 8 lines 11-31).

**3.6** Regarding claim 6 Pettigrew does not expressly disclose, wherein residual errors computed reflect the amount by which each trend point varies from the smoothed curve.

However, Morrison teaches (Col. 4 lines 22-29 “...applies a line-fit to a set of input and output data...” and regarding residual errors see Col. 4 lines 22-30).

**3.7** Regarding claim 7 the examiner notes that a *sigma* is a figure of merit for standard deviation and therefore any teaching of a standard deviation teaches *sigma* being calculated for a set of data points. Therefore, while Pettigrew does teach the calculation of means Morrison goes further and discloses the functional equivalent for determining a statistical figure of merit or a sigma (see Col. 9 lines 2-9 “...any desired type of statistical variables such as means, mediums, minimums, maximums, standard deviations, etc...” in view of the combined teachings the claimed limitations of claim 7 are obvious.

**3.8** Regarding claim 8, Pettigrew does not expressly disclose, wherein a good model is best represented by lower estimated sigma values, however Morrison teaches the functional

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equivalent of this claimed limitation, see Col. 15 lines 9-64 of Morrison for a discussion of how a model is qualified and made “good” see also the rejection of claim 4 above.

**3.9** Regarding claim 9, see the rejection of claim 1 above.

**3.10** Regarding claim 10, see the rejection of claim 2 above.

**3.11** Regarding claim 11, see the rejection of claim 3 above.

**3.12** Regarding claim 12, see the rejection of claim 4 above.

**3.13** Regarding claim 13, the rejection of claim 1 substantially teaches all the limitations as presented in claim 13 with the following exceptions, claim 1 does not claim plotting data points or fitting a smoothed curve or computing residual errors. Pettigrew teaches a means for plotting data points (Figure 2 # 120 and Col. 4 lines 44-49), and Morrison teaches a means for time-varying analysis and means for smoothing a curve (Col. 4 lines 22-29 “...applies a line-fit to a set of input and output data...” further and in regards to residual errors Morrison teaches (Col. 4 lines 22-30).

**3.14** Regarding claim 14, Pettigrew teaches how each trend point varies from a curve (see the plot in figure 3) however Pettigrew does not expressly disclose smoothing a curve, However Morrison discloses (Col. 4 lines 22-29 “...applies a line-fit to a set of input and output data...”).

**3.15** Regarding claim 15 see the rejection of claim 7 above.

**3.16** Regarding claim 16 see the rejection of claim 8 above.

**3.17** Regarding claim 17 see the rejection of claim 1 above.

**3.18** Regarding claim 18, see the rejection of claim 2 above.

**3.19** Regarding claim 19, see the rejection of claim 3 above.

**3.20** Regarding claim 20, see the rejection of claim 4 above.



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- 3.21 Regarding claim 21, see the rejection of claim 5 above.
- 3.22 Regarding claim 22, see the rejection of claim 6 above.
- 3.23 Regarding claim 23, see the rejection of claim 7 above.
- 3.24 Regarding claim 24, see the rejection of claim 8 above.

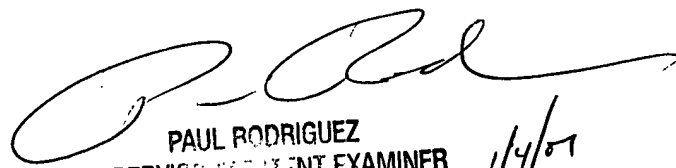
### *Conclusion*

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dwain M. Craig whose telephone number is (571) 272-3710. The examiner can normally be reached on 10:00 - 6:00 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul L. Rodriguez can be reached on (571) 272-3753. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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